

REMARKS

At the outset, on June 6, 2006, Applicant filed an Information Disclosure Statement. Applicant requests that the Examiner indicate on the record that he reviewed the Information Disclosure Statement and the references cited therein.

Claims 1-17, 19-21 and 46-54 are pending in this application, of which claims 7, 10, 13, 14, 17, 19 and 20 were withdrawn.

Applicants acknowledge the allowance of claims 21 and 46-54.

Dependent claims 4-6, 15 and 16 are objected to, but would be allowable if re-written in independent form. These claims were also considered allowable in the previous Office Action mailed March 6, 2006. In the previous Office Action, claim 18 was also considered to be allowable. In response to that Office Action, Applicant had canceled claim 18 and incorporated the limitations set forth therein into claim 1. The Examiner has now withdrawn the allowability of claim 18. Applicant therefore has deleted the limitations of claim 18 from claim 1 and incorporated those limitations into new dependent claim 70.

Claim 1 has been amended to clarify that the claimed method determines the maximum acceleration limits corresponding to the maximum allowable vertical inceptor position limits. Claims 2-11, 15, 19 and 20 have been amended to conform to amended claim 1. New independent claim 71 and dependent claims 72-73 are introduced to recite a method that determines the maximum deceleration limits corresponding to the minimum allowable vertical inceptor position limits. Thus, original claim 1 has been broken into 2 claims (1 and 71) to clarify that the invention does not require the determination of both maximum and deceleration limits. No new matter has been added. *See, for example*, ¶¶ 102-103 of the specification.

Claims 1-3, 9, 11 and 12 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,863,012 to Rollet. Applicants respectfully request reconsideration of this rejection. Rollet does not disclose, teach or suggest a method for using information from the vertical inceptor to determine acceleration (claim 1) and/or deceleration (claim 71) limits for the longitudinal or lateral axis of an aeronautical vehicle. In the methods of claims 1 and 71, acceleration and deceleration limits are calculated based on the vertical inceptor position required to maintain a vertical state and limits of the vertical inceptor. The acceleration and/or deceleration limits can be pitch and/or roll attitude limits (e.g., claims 2 and 72) or longitudinal inceptor limits (e.g., claims 4 and 73).

In contrast, the Rollet patent describes a system for adjusting the trimmed position of the longitudinal control inceptor in an aircraft in order to maintain “Longitudinal Static Stability”.¹

¹ Longitudinal Static Stability is one of the fundamental measurements of aerodynamic stability of an aircraft. It determines if an aircraft will return to its original trimmed airspeed after being disturbed from its trimmed airspeed by a wind gust. In virtually all aircraft, the longitudinal inceptor (i.e. longitudinal or pitch control stick) controls the pitch attitude (angle) of the aircraft. If the longitudinal inceptor is pushed forward, the pitch attitude decreases (nose comes down) and the aircraft accelerates. If the longitudinal inceptor is pulled back, the pitch attitude increases (nose comes up) and the aircraft slows down. For an aircraft to fly at a constant airspeed, the pilot must find the precise pitch attitude such that the aircraft neither accelerates nor decelerates. The pilot does this by adjusting the longitudinal inceptor until he finds this precise pitch attitude. This precise pitch attitude is called a “trimmed pitch attitude”. In addition to having the longitudinal inceptor control the pitch attitude, virtually every aircraft has the effect of a centering spring on the longitudinal inceptor so that the longitudinal inceptor returns to a predetermined position when the pilot relaxes his forces. The pilot can set this centering position so that the longitudinal inceptor returns to the correct position for holding the “trimmed pitch attitude”. This is called the “trimmed longitudinal inceptor position”.

If the characteristics of an aircraft are such that the “trimmed longitudinal inceptor position” constantly moves forward with increasing airspeed, then the aircraft is said to exhibit Positive Longitudinal Static Stability and it will be relatively easy to maintain airspeed. If the “trimmed longitudinal inceptor position” constantly moves backwards with increasing airspeed, then the aircraft will exhibit Negative Longitudinal Static Stability and the pilot will have to constantly adjust the longitudinal inceptor to maintain airspeed and the aircraft will be more difficult to fly.

For example, if an aircraft with Positive Longitudinal Static Stability is trimmed at 100 knots and is hit by a wind gust that slows the airspeed to 90 knots, the Positive Longitudinal Static Stability causes the

This is useful because many helicopters exhibit Negative Longitudinal Static Stability for a certain airspeed range, but is completely unrelated to the method recited in claim 1. The Rollet patent proposes to adjust the trim position of the longitudinal inceptor using a motor that is driven from the error of a reference airspeed (V_{ref}) and the measured airspeed (V_1), and thereby create the effect of Positive Longitudinal Static Stability. The Rollet patent also discloses a minimum airspeed (V_{min}) below which the aircraft exhibits Positive Longitudinal Static Stability, and therefore does not require any compensation. Likewise, a maximum airspeed (V_{max}) is disclosed, above which compensation is also not required. However, the Rollet patent does not disclose, teach or suggest how to determine the values of V_{max} and V_{min} .

Most fundamentally, V_{max} and V_{min} disclosed in the Rollet patent are inherently different from the calculated acceleration and deceleration limits recited in claim 1. Claims 1 and 71 recite acceleration and deceleration limits, which refer to control positions beyond which a vertical state cannot be maintained. In contrast, Rollet's V_{max} and V_{min} are not longitudinal inceptor positions, nor are they limits. V_{max} and V_{min} are simply airspeeds beyond which Rollet's augmentation is not required (i.e., the command to the actuator is "nil").

Further, the Rollet patent does not disclose, teach or suggest any method for holding altitude (as distinct from attitude) or any other vertical control of an aircraft. Figure 1 of the Rollet patent discloses a vertical inceptor (LCo), but it is not utilized in the invention.

longitudinal inceptor to be trimmed too far forward for maintaining an airspeed of 90 knots and the aircraft will pitch nose down slightly and accelerate. When the aircraft reaches 100 knots, the longitudinal inceptor position will again command the trimmed pitch attitude and the aircraft will no longer accelerate or decelerate. If the aircraft had Negative Longitudinal Static Stability, then the tendency would be to pitch nose up when it had decelerated to 90 knots, causing it to decelerate even further until the pilot corrects the imbalance.

Therefore, claims 1 and 71 and all claims depending thereon are patentable over the Rollet patent by itself. Applicants accordingly submit that this rejection must be withdrawn.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Rollet in view of U.S. Patent No. 6,334,592 to Tomio. Applicants respectfully request reconsideration of this rejection. Claim 8 depends from claim 1, and is believed patentable over Rollet by itself for the reasons set forth above. Tomio does not overcome the deficiencies of Rollet. The Examiner cites Tomio only for disclosure of a stability augmentation system. Therefore, the combination of Rollet and Tomio do not disclose teach or suggest the method recited in claim 1.

It is therefore believed that independent claim 1, and claims 2-6, 8, 9, 11, 12, 15-17 and 70 dependent thereon, and independent claim 71, and claims 72-73 dependent thereon, are now allowable. Claims 7, 10, 13, 14, 17, 19 and 20, which were drawn to a non-elected species, are now allowable because they depend from allowable generic claim 1.

Accordingly, in view of the foregoing Remarks, Applicants submit that claims 1-17, 19-21, 46-54 and 70-73 are allowable and in a proper condition for allowance.

The Examiner is invited to telephone Applicants' undersigned attorney at (212) 681-0600 if any unresolved matters remain and/or to set up a telephone interview with the inventor to discuss the merits of the amended claims.

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Respectfully submitted,

OSTRAGER CHONG FLAHERTY
& BROITMAN P.C.
Customer No. 64722

By: /joshua s. broitman/
Joshua S. Broitman
Reg. No. 38,006
250 Park Avenue, Suite 825
New York, New York 10177-0899
(212) 681-0600
Attorneys for Applicant